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(54) ROTARY DISPENSER

(57) A treat dispenser includes a housing having an interior compartment. The housing has an opening formed therein communicating with the compartment. The treat dispenser further includes a turntable within and rotatable with respect to the housing and an actuator coupled to the turntable. The actuator is configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed within the compartment and on the turntable is ejected radially from the housing through the opening.

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates in general to dispensers suitable for dispensing food and/or treats, for example, to household pets.

[0002] Animal food and/or animal treat dispensers are commonly provided to household pets, such as dogs and cats, to supply nutrition, to promote dental cleaning, to provide healthy physical exercise and mental stimulation, and to reduce destructive behaviors arising from boredom. A number of different pet feeders and treat dispensing pet toys that hold and/or dispense treats have been patented and/or introduced into the pet toy market in recent years.

[0003] For example, U.S. Patent No. 5,176,103 discloses a rotary feeder for animals including a base containing a plurality of food receptacles disposed around the base, an indexable cover rotationally supported by the base and having an opening giving access to each receptacle in turn when the cover is indexed. The rotary feeder further includes a motor drive unit that, when periodically energized, rotates the drive unit and with it the cover so as to index the cover opening in turn from receptacle to receptacle.

[0004] U.S. Patent No. 5,222,461 discloses an animal activated feeder having abase, which supports a central cradle for rotation about a central axis. A circular food bowl having a number of receptacles can be positioned on the cradle to rotate with it, or lifted off for cleaning. The base includes a central spring housing having a flat helical torsion spring (i.e., a "clock spring"), which rotates the cradle and food bowl. Rotation is indexed in increments by a pet activated foot pedal. Indexing is limited to feed one receptacle at a time. Spinning of the food bowl is prevented by a group of lugs projecting from the cradle.

[0005] U.S. Patent No. 8,424,489 discloses a feeding device including a first food-receiving portion within an upper side of a main body. The first food-receiving portion comprises independent first food compartments disposed in axis-symmetrical positions with reference to a central vertical axis. A first cover having at least one access aperture is positioned over the first portion and is supported for free rotation upon actuation by the animal being fed. Independent second food-receiving portions, each comprising two second food compartments separated from one another by a transversal wall, are provided adjacent to the first portion. Each second portion has a corresponding second cover that is in sliding engagement therewith and freely movable upon actuation by the animal being fed. The combination of rotating and sliding covers is said to create stimulating challenges for the animal.

[0006] U.S. Patent Publication No. 2005/0066905 A1 discloses an automated pet feeder having a rotatable food bowl including cavities made accessible to a pet at predetermined feeding times. A lid with an opening for exposing one of the cavities is positioned above the bowl. A base unit that supports the bowl is configured to rotate the bowl while the lid remains stationary and to monitor the position of the bowl. A timing mechanism controls rotation of the bowl and sequentially positions a next cavity under the opening at feeding times that may be set to occur at various time intervals or clock times that may be pre-programmed by a user.

[0007] U.S. Patent Publication No. US 2017/0042116 A1 discloses a feeding bowl including a tapering main body having a feeding bowl base and a central opening. The tapering main body has an interior part configured to engage a rotary mechanism and an exterior part configured with a plurality of annular partition walls for delimiting a plurality of (e.g., 7) food compartments, which may be configured as chutes. The tapering shape of the main body allows food to be easily loaded into the food compartments via the central charging opening. The food will move along the inclined upper face of the feeding bowl towards the inner face of the first lid part simply under the influence of gravity. When a food compartment is moved by rotation to the outlet opening, the food is brought along by the partition walls, and optionally by the inner face of the first lid part. At the end of a rotation step, the food is discharged via the outlet simply under the influence of gravity. The main body is rotated by a motor unit of the rotary mechanism. The actuator of the rotation of the main body by may be a spring-biased elongated body having at least a manipulation end positioned in and/or extending through the central opening of the tapering body of the feeding bowl so as to be accessible for the animal from outside the food dispenser either directly or due to the manipulation end being connected to the second lid part. The spring serves to reciprocate the actuator after the animal has pressed the actuator axially towards the base plate to activate the motor unit of the rotary mechanism.

[0008] These and other similar pet feeder and pet toys seek to incentivize an animal's extended interaction with the pet feeder or pet toy by dispensing animal food and/or animal treats in response to the animal's interaction with the pet feeder or pet toy. However, in practice, an extended interval of animal interaction with the pet feeder or pet toy may not be achieved for some pet feeders or pet toys, for example, because the pet feeder or pet toy dispenses food or treats too rapidly or in too large a quantity or because the pet feeder or pet toy makes it too difficult for the pet to obtain sufficient reward. As a result, the pet can become disinterested in the pet feeder or pet toy.

BRIEF SUMMARY

[0009] In at least some embodiments, a treat dispenser includes a housing having an interior compartment. The housing has an opening formed therein communicating with the compartment. The treat dispenser further in-

cludes a turntable within and rotatable with respect to the housing and an actuator coupled to the turntable. The actuator is configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed within the compartment and on the turntable is ejected radially from the housing through the opening. A base may be coupled to the housing, wherein the base includes a central axle and the turntable is mounted on and rotates about the central axle. The base may be configured to be selectively coupled to and decoupled from the housing. The turntable may include a surface having at least one raised feature that is configured to co-rotate treats disposed on the surface with the turntable. The compartment may be bounded by a curved wall. The curved wall may have a projection adjacent the opening. The treat dispenser may further comprise a deflector adjacent the opening. The deflector may be configurable in multiple positions such that a probability of the treat being ejected from the body can be varied. The actuator may include a button configured for reciprocating linear translation. The button may have a surface overlaying at least a portion of the compartment. The actuator may include a helical gear coupled to the button and a rotary drive gear coupled to the helical gear, the rotary drive gear including at least one cog; and the turntable may include at least one tooth that engages the at least one cog of the rotary drive gear such that the turntable co-rotates with the rotary drive gear. The compartment may be a first compartment; the opening may be a first opening; and the housing may include a second compartment within the first compartment and may communicate with the first compartment via a second opening.

[0010] In at least some embodiments, a treat dispenser, may comprise: a housing including at least one wall at least partially defining a compartment, the at least one wall having an opening formed therein; a turntable within a rotatable with respect to the housing, wherein the turntable includes at least one tooth; an actuator including a button and gearing, wherein the gearing includes a rotary drive gear having at least one cog that engages the at least one tooth of the turntable, and wherein the gearing is configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed on the turntable and within the compartment is ejected radially from the body through the opening. The treat dispenser may further comprise: a base coupled to the housing, wherein the base includes a central axle and the turntable is mounted on and rotates about the central axle. The turntable may include a surface having at least one raised feature that is configured to co-rotate treats disposed on the surface with the turntable. The at least one wall may have a projection adjacent the opening. The treat dispenser may further comprise a deflector adjacent the opening. The button may be configured for reciprocating linear translation. The housing may have an end cap; and the button may cover the end cap.

[0011] In at least some embodiments, a method of dispensing pet treats, may comprise: providing a treat dispenser, including: a housing having an interior compartment, the housing having an opening formed therein communicating with the compartment; a turntable within and rotatable with respect to the housing; and an actuator coupled to the turntable and configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed within the compartment and on the turntable is ejected radially from the housing through the opening. loading the compartment with one or more animal treats; and placing the treat dispenser on a substrate accessible to a pet.

[0012] Additional embodiments are disclosed herein.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0013]

Figure 1 is an exterior perspective view of a treat dispenser in accordance with one embodiment.

Figure 2 is an exploded perspective view of a treat dispenser in accordance with one embodiment.

Figure 3 is a top plan view of a treat dispenser in accordance with one embodiment.

Figure 4 is a bottom plan view of a treat dispenser in accordance with one embodiment.

Figure 5 is an interior perspective view of a treat dispenser in accordance with one embodiment.

Figure 6 is a section view of a treat dispenser in accordance with one embodiment.

[0014] In the following discussion, like and corresponding reference numbers are utilized to identify the same or similar elements in various embodiments. Elements are generally identified utilizing three-digit numbers, with the first digit identifying the number of the figure by reference to which the element is first described.

DETAILED DESCRIPTION

[0015] With reference now to the figures and in particular with reference to **Figure 1,** there is illustrated an exterior perspective view of a treat dispenser **100** in accordance with one embodiment. Generally, treat dispenser **100** includes at least a housing **102** having at least one interior compartment into which animal treats and/or dry pet food (collectively referred to herein as "animal treats") may be loaded. Housing **102** may in some embodiments have at least one support **104** (e.g., in this embodiment, a circumferential rim) that improves stability of treat dispenser **1002** when placed on an underlying substrate, such as the floor or ground. As best seen in the plan view provided in **Figure 3,** support **104** may bear

indicia, such as number, letters, images, symbols, graphics, or the like. In this example, support **104** has molded therein numerals simulating those found on a roulette wheel. Housing **102** has at least one aperture **106** out of which the animal treats and/or animal food may be dispensed from the interior compartment in response to animal manipulation of an actuator **108,** as discussed further herein. As illustrated in **Figures 1** and **3,** treat dispenser **100** may optionally include one or more additional fill holes **110a, 110b** through which animal treats may be loaded into the at least one interior compartment of housing **102,** as well as one or more optional recesses **112** (e.g., blind holes) into which an attractant (e.g., an animal treat, a dry, liquid, or paste food item, or odorant) may be placed in order to incentivize animal interaction with treat dispenser **100.** Although not required, in the depicted embodiment, fill holes **110a, 110b** and recesses **112** are both formed in actuator **108.** By rewarding animal interaction with treat dispenser **100,** treat dispenser **100** decreases animal boredom, stimulates an animal's mental and physical activity, and increases a period of animal engagement with treat dispenser **100.**

[0016] As further illustrated in the exploded perspective view given in **Figure 2** and the bottom plan view given in **Figure 4,** in some embodiments, treat dispenser **100** further includes a base **202** having an outer surface **204** and an opposing inner surface **206.** Inner surface **206** of base **202** has a central axle **208** projecting therefrom. Outer surface **204** is preferably configured to permit the assembled treat dispenser **100** to stably rest on an underlying substrate, such as a floor or the ground. In some embodiments, treat dispenser **200** is configured to discourage detachment of base **202** from housing **102** following initial assembly. In such embodiments, base **202** can be coupled to housing by screws, adhesive, sonic welding, etc. In other embodiments, base **202** can be readily coupled to and decoupled from housing **102** by a human operator, for example, to permit cleaning of, or removal of animal treats from, the interior of housing **102.** In such embodiments, base **202** can be assembled to housing, for example, using manually manipulable interlocking structures. In one specific example, base **202** includes one or more tabs **205** extending outwardly from its peripheral edge that can be received within corresponding recesses and slots in housing **102.** Base 202 can be secured to housing **102** by placing tabs **205** of base **202** in the recesses of housing **102** and then rotating base **202** with respect to housing **102** to secure tabs **205** in the slots of housing **102.** This process can be reversed to remove base **202** from housing **102.** As seen in **Figures 2** and **4,** outer surface **204** may optionally have one or more features formed therein (e.g., in this case finger holes **201)** to facilitate manual user assembly of base **202** to housing **102** and manual user disassembly of base **202** from housing **102.**

[0017] Referring again to **Figure 2,** treat dispenser **100** additionally includes a turntable **210** having a first surface **212,** an opposing second surface **214,** and a central hub **216,** which in this example extends from second surface **214.** Turntable **210** is preferably radially symmetric, and in the depicted example is substantially circular in plan. When turntable **210** is assembled to base **202,** hub **216** is rotatably mounted on central axle **208** of base **202** such that turntable **210** freely spins on central axle **208.** In preferred embodiments, turntable **210** and base **102** are configured such that when hub **216** is assembled on axle **208** and a load of animal treats are placed on second surface **214,** an air gap is retained between first surface **212** of turntable **210** and inner surface **206** of base **202.** This spacing between first surface **212** of turntable **210** and inner surface **206** of base **202** can be obtained, for example, by implementing a shoulder of appropriate dimension about axle **208** such that a bearing surface of hub **216** stops against the shoulder. In the depicted embodiment, second surface **214** of turntable **210** is generally planar, but may optionally include one or more raised features or projections **218** to promote rotational movement of treats resting on second surface **214** in concert with the rotation of turntable **210** rather than inertial sliding. In the depicted example, projection **218** is implemented as a raised ridge extending radially from hub **216** substantially to an outer edge of second surface **214.**

[0018] In the depicted embodiment, housing **102** has a substantially cylindrical or frusto-conical central body **220** that tapers slightly as it extends from support **104.** Central body **220** has an end cap **222** in which one or more fill holes **230a, 230b** communicating with fill holes **110a, 110b** are formed. End cap **222** may additionally include one or more recesses **228** corresponding in location to, and sized to receive therein, the walls defining recesses **112.** End cap **222** has a central well **232** defined by at least one sidewall, and at a furthest extent of well **232,** a well plate having a gear collar formed there through. As further shown in **Figure 2,** end cap **222** may optionally additionally have one or more (and in this example, four) post holes **234** formed therein, with each post hole **234** configured to receive there through a corresponding guide post of actuator **108,** as discussed further below with reference to **Figure 6.**

[0019] In the depicted embodiment, actuator **108** includes a button **240** that is manipulable by a pet to cause one or more treats to be dispensed by treat dispenser **100** via opening **106** of housing **102.** In the illustrated embodiment, button **240** includes at least one sidewall **242** and a upper surface **244** defining an interior volume that is generally sized and configured to receive therein at least a portion of central body **220** of housing **102.** In this example, button **240,** like central body **220** of housing **102,** has a substantially cylindrical or frusto-conical form. When assembled to housing **102,** button **240** is coupled to housing, for example, by one or more fasteners (e.g., screws) as discussed further below. When so assembled, button **240** is configured to be linearly translated between an unactuated state (as shown in **Figure 1)** in which button **240** is extended away from housing **102** a maximum distance and an actuated state in which button

240 is fully depressed toward housing **102.** Button **240** is urged toward its unactuated state and, if released from its actuated state, returned to its unactuated state by a spring **246** supported by the well plate disposed in central well **232** of housing **102.**

[0020] Actuator **108** additionally includes gearing configured to rotate turntable **210** based on the reciprocating linear translation of button **240** (e.g., by a paw or muzzle of a pet or by a human operator) from the unactuated state toward the actuated state and back to the unactuated state. In the illustrated embodiment, this gearing includes a helical gear **248** that is rigidly coupled to a central portion of the interior surface of button **240** by a mounting plate **249.** The gearing additionally includes a rotary drive gear **250** having cogs **252** configured to mesh with teeth **217** of hub **216.** When actuator **108** is assembled to housing **102,** helical gear **248** passes through and is threadedly coupled by an interior thread to rotary drive gear **250,** which is captured for rotation within the gear collar of central well **232.** Although in the illustrated embodiment actuator **108** is depicted as converting linear reciprocating motion into rotary motion, those skilled in the art will appreciate that in other embodiments an actuator may instead rotate turntable **202** based upon other actuation motions, including a rotary motion and/or a pivotal motion of the actuator.

[0021] With reference now to **Figure 5,** there is illustrated an interior perspective view of treat dispenser **100** in accordance with one embodiment. In this view, treat dispenser **100** is illustrated from the side opposite button **242** with base **202** removed. As noted above, in the illustrated embodiment, a human operator can removably couple base **202** to housing **102** by placing each of tabs **205** of base **202** into a corresponding relief area **500** in housing **102** and by then rotating base **202** clockwise with respect to housing **102,** for example, with the aid of finger holes **201** in base **202.** Tabs **205** will thus be retained within a corresponding slot **502** formed in housing **102** until the human operator rotates base **202** counterclockwise with respect to housing **102,** for example, to empty animal treats from housing **102** and/or to clean the interior of housing **102.**

[0022] In various embodiments, housing **102** includes one or more interior compartments. In the embodiment specifically depicted in **Figure** 5, the interior of housing **102** includes a first compartment **506** bounded by at least one outer wall **508** substantially surrounding first compartment **506.** First compartment **506** communicates with an exterior of treat dispenser **100** via aperture **106** in outer wall(s) **508.** Outer wall(s) **508,** which in this case generally correspond to the form of central body **220** of housing **102,** can generally have any desired contour, profile, and cross-sectional shape and are not required to define a generally cylindrical or frusto-conical form, as depicted in **Figure 5.**

[0023] In the depicted embodiment, housing **102** additionally includes an interior second compartment **510,** which, in the embodiment depicted in **Figure 5,** is within first compartment **506** and bounded by at least one inner wall **512.** If present, second compartment **512** communicates with first compartment **506** via an opening **514** through inner wall **512.** Animal treats can be selectively loaded into second compartment **510** via fill hole **230b** (which communicates with fill hole **110b** of actuator **108),** and can similarly be selectively loaded into first compartment **506** via fill hole **230a** (which communicates with fill hole **110a** of actuator **108).** As will be appreciated, animal treats loaded into second compartment **510** are less likely to be dispensed from treat dispenser **100** in response to actuation of actuator **108** than animal treats loaded into first compartment **506,** as animal treats loaded into second compartment **510** must first be ejected from second compartment **510** into first compartment **506** prior to being dispensed from first compartment **506** via aperture **106.**

[0024] In the exemplary embodiment depicted in **Figure 5,** second compartment **510** is specially configured to regulate the passage of animal treats and/or animal food items through opening **514.** In particular, inner wall **512** defining second compartment **510** includes, adjacent to opening **514,** a ramp portion **516** having greater curvature relative to adjacent portions of inner wall **512.** As will be appreciated, in the illustrated embodiment, animal treats and/or animal food items placed into first compartment **506** and second compartment **510** generally circulate in a counter-clockwise direction (viewed from the given perspective) in response to actuation of actuator **108.** Based on their inertia, animal treats or animal food items naturally tend to distribute themselves and move with little relative movement along inner wall **512** and/or outer wall **508.** Ramp portion **516** serves to interrupt the smooth transport of animal treats and/or animal food items along inner wall **512** by causing the animal treats and/or animal food items to congregate and/or collide adjacent ramp portion **516,** increasing a probability of ejection of one or more animal treats and/or animal food items from second compartment **510** via opening **514.** A baffle **518** adjacent opening **514** that extends from inner wall **512** into first compartment **506** decreases a probability that any animal treats within first compartment **506** will enter second compartment **510** via opening **514.**

[0025] In the exemplary embodiment of housing **102** shown in **Figure 5,** first compartment **506** is similarly specially configured to regulate the dispensing of animal treats and/or animal food items from first compartment **506** through aperture **106.** In this example, outer wall **508** includes a projection **520** adjacent aperture **106** and preceding opening **106** along a path of travel of animal treats in first compartment **506.** In the depicted embodiment, projection **520** takes the form of a ramp of generally increasing projection (and/or curvature) into first compartment **506** at portions closer to aperture **106.** Like ramp portion **516** of inner wall **512,** projection **520** serves to interrupt an inertial path of travel of animal treats along outer wall **508** of first compartment **506.** As the inertial path of travel of animal treats is interrupted, animal treats

tend to congregate and/or collide, increasing a probability that one or more animal treats may be ejected from treat dispenser **100** via aperture **106.** To increase the probability that one or more animal treats within first compartment **506** are, in fact, dispensed from first compartment **506** via aperture **106,** treat dispenser **100** optionally, but preferably, further provided with a deflector **522** adjacent aperture **106.** In the illustrated embodiment, deflector **522** is positioned following aperture **106** along a path of travel of animal treats within first compartment **506.** However, in other examples, deflector **522** may alternatively be positioned substantially in radial alignment with aperture **106** or preceding aperture **106** along the path of travel of animal treats within first compartment **506.** In some embodiments, deflector **522** can be coupled to housing **102,** and in some embodiments the position and/or orientation of deflector **522** can be user-selectable in order to increase or decrease the probability an animal treat is ejected from treat dispenser **100** via aperture **106** in response to an actuation of actuator **108.** For example, in the depicted embodiment, a human operator may selectively rotate deflector **522** in order to adjust an angle of deflector **522** relative to the travel path of animal treats using an adjustment mechanism, such as screw **524.**

[0026] Referring now to **Figure 6,** there is depicted a section view of a treat dispenser **100** in an unactuated state in accordance with one embodiment. In the embodiment of **Figure 6,** an actuator **108** and a base **202** to which a turntable **210** is coupled are assembled to housing 102. In this example, fill holes **110a, 110b** in button **240** communicate with fill holes **230a, 230b** of end cap **222** via fill tubes **600a, 600b,** respectively. Fill tubes **600a, 600b** ensure that animal treats do not enter the space between button **240** and housing **102.** In addition, one or more guide posts **602** of button **240** are assembled through one or more corresponding post holes **234** in end cap **222** of housing **102.** In some embodiments, guide posts **602** are retained in post holes **234** following assembly of button **240** to housing **102** by the insertion of screws (optionally in combination with washers) having a greater dimension than post holes **234** into the ends of guide posts **602.**

[0027] **Figure 6** further illustrates the gearing utilized to rotate turntable **214** in response to actuation of actuator **108** in accordance with one embodiment. In particular, helical gear **248** is coupled to button **240** by mounting plate **249,** which may be attached to button **240,** for example, by screws or other fasteners. Rotary drive gear **250** is threadedly received on helical gear **248** and is also captured within gear collar **608** for rotation therein. In this example, rotary drive gear **250** is retained within gear collar **608** by one or more ears **606,** which may be elastically deformed (e.g., by manual force alone) to enable rotary drive gear **250** to be installed within gear collar **608.** When rotary drive gear **250** is installed in gear collar **608,** cogs **252** of rotary drive gear **250** mesh with corresponding teeth **217** within hub **216** of turntable **210.**

[0028] In order to use treat dispenser **100,** a human operator can load one or more animal treats **610** within one or more interior compartments of housing **102,** for example, via fill holes **110a, 110b** (if present) and/or aperture **106.** The human operator can also optionally place an attractant on treat dispenser **100,** for example, within one or more recesses **112,** in order to incentivize animal interaction with treat dispenser **100.** The human operator can then provide the loaded treat dispenser **100** to a pet, for example, by placing the loaded treat dispenser **100** on the floor or ground.

[0029] The human operator may optionally train a pet, such as a dog, to actuate actuator **240,** for example, by reinforcing this behavior through the direct provision by the human operator of a treat or other reinforcement (e.g., a click from a training clicker). The pet's actuation of actuator **108** will, of course, be further reinforced by the random dispensing of one or more treats **610** from treat dispenser via aperture **106.** Specifically, actuation (e.g., depression) of button **240,** for example, by a paw or muzzle of the pet, will cause helical gear **248** to be driven downward through the threaded interior of rotary drive gear **250.** As a result, rotary drive gear **250** will rotate within gear collar **608** and, through the engagement of cogs **252** and teach **217,** rotate turntable **210.** As turntable **210** rotates, animal treats **610** resting on turntable will be accelerated through frictional engagement with second surface **214** and/or other animal treats and/or a raised feature (e.g., projection **218)** on second surface **214.**

[0030] As noted above, the inertia of animal treats **610** will cause the treats to generally travel along outer wall **508** or inner wall **512** in the direction of rotation of turntable **210.** For some animal treats **610** and for some actuations of actuator **108,** this travel path is interrupted by contact of the animal treats **610** with ramp portion **516** of inner wall **512** or projection **520** from outer wall **508** (and/or another animal treat **610).** As a result, one or more animal treats **610** may randomly progress from second compartment **510** to first compartment **506** via opening **514** or be ejected from first compartment **506** via aperture **106.** As noted above, deflector **522,** if present, can be utilized to increase a probability of an animal treat **610** being ejected from treat dispenser **100** via aperture. It should be appreciated that a treat dispenser **100** as described herein does not meter or portion the dispensing of animal treats and that actuation of actuator **108** does not guarantee dispensing of any animal treats **610** whatsoever. The unpredictable nature of treat dispensing as described herein - with a relatively high, but not too high probability - promotes continued pet engagement with treat dispenser **100** without over-dispensing treats.

[0031] As has been described, in at least some embodiments, a treat dispenser includes a housing having an interior compartment. The housing has an opening formed therein communicating with the compartment. The treat dispenser further includes a turntable within and rotatable with respect to the housing and an actuator coupled to the turntable. The actuator is configured to

impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed within the compartment and on the turntable is ejected radially from the housing through the opening.

[0032] Various embodiments of the treat dispenser can be made, for example, by injection molding its principal components (e.g., base **202,** turntable **210,** housing **102,** button **240,** rotary drive gear **250)** from one or more plastics and/or elastomers, as is known in the art. Following production of the components, the components can be assembled, for example, by snap fit, threaded connection, adhesive, sonic welding, and/or with fasteners (e.g., screws).

[0033] While various embodiments have been particularly shown and described, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and scope of the appended claims and these alternate implementations all fall within the scope of the appended claims. Further, features of various of the disclosed embodiments may be combined, as will be appreciated by those skilled in the art. References herein to an embodiment or embodiments do not necessarily refer to the same embodiment or embodiments. The terms "about" or "approximately," when used to modify quantities or ranges, are defined to mean the stated value(s) plus or minus 5%. The term "coupled" is defined to mean attachment or cooperation of members possibly through one or more intermediate members.

[0034] Here follow itemized embodiments that are part of the description, embodiment 1: A treat dispenser, comprising: a housing including at least one wall at least partially defining a compartment, the at least one wall having an opening formed therein; a turntable within a rotatable with respect to the housing, wherein the turntable includes at least one tooth; an actuator including a button and gearing, wherein the gearing includes a rotary drive gear having at least one cog that engages the at least one tooth of the turntable, and wherein the gearing is configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed on the turntable and within the compartment is ejected radially from the body through the opening.

Embodiment 2: The treat dispenser of embodiment 1, and further comprising: a base coupled to the housing, wherein the base includes a central axle and the turntable is mounted on and rotates about the central axle.

Embodiment 3: The treat dispenser of embodiment 1, wherein: the turntable includes a surface having at least one raised feature that is configured to co-rotate treats disposed on the surface with the turntable.

Embodiment 4: The treat dispenser of embodiment 3, wherein the at least one wall has a projection adjacent the opening.

Embodiment 5: The treat dispenser of embodiment 3, and further comprising a deflector adjacent the opening.

Embodiment 6: The treat dispenser of embodiment 1, wherein the button is configured for reciprocating linear translation.

Embodiment 7. The treat dispenser of embodiment 1, wherein: the housing has an end cap; and the button covers the end cap.

Claims

1. A treat dispenser, comprising:

   a housing having an interior compartment, the housing having an opening formed therein communicating with the compartment;
   a turntable within and rotatable with respect to the housing; and
   an actuator coupled to the turntable and configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed within the compartment and on the turntable is ejected radially from the housing through the opening.

2. The treat dispenser of Claim 1, and further comprising:
   a base coupled to the housing, wherein the base includes a central axle and the turntable is mounted on and rotates about the central axle.

3. The treat dispenser of Claim 1, wherein the base is configured to be selectively coupled to and decoupled from the housing.

4. The treat dispenser of Claim 1, wherein:
   the turntable includes a surface having at least one raised feature that is configured to co-rotate treats disposed on the surface with the turntable.

5. The treat dispenser of Claim 1, wherein the compartment is bounded by a curved wall.

6. The treat dispenser of Claim 5, wherein the curved wall has a projection adjacent the opening.

7. The treat dispenser of Claim 1, and further comprising a deflector adjacent the opening.

8. The treat dispenser of Claim 7, wherein the deflector is configurable in multiple positions such that a probability of the treat being ejected from the body can be varied.

9. The treat dispenser of Claim 1, wherein the actuator includes a button configured for reciprocating linear translation.

10. The treat dispenser of Claim 9, wherein the button has a surface overlaying at least a portion of the compartment.

11. The treat dispenser of Claim 9, wherein:

the actuator includes a helical gear coupled to the button and a rotary drive gear coupled to the helical gear, the rotary drive gear including at least one cog; and
the turntable includes at least one tooth that engages the at least one cog of the rotary drive gear such that the turntable co-rotates with the rotary drive gear.

12. The treat dispenser of Claim 1, wherein:

the compartment is a first compartment;
the opening is a first opening; and
the housing including a second compartment within the first compartment and communicating with the first compartment via a second opening.

13. A method of dispensing pet treats, comprising:

providing a treat dispenser, including:

a housing having an interior compartment, the housing having an opening formed therein communicating with the compartment;
a turntable within and rotatable with respect to the housing; and
an actuator coupled to the turntable and configured to impart rotation to the turntable based on manipulation of the actuator, such that an animal treat disposed within the compartment and on the turntable is ejected radially from the housing through the opening. loading the compartment with one or more animal treats; and

placing the treat dispenser on a substrate accessible to a pet.

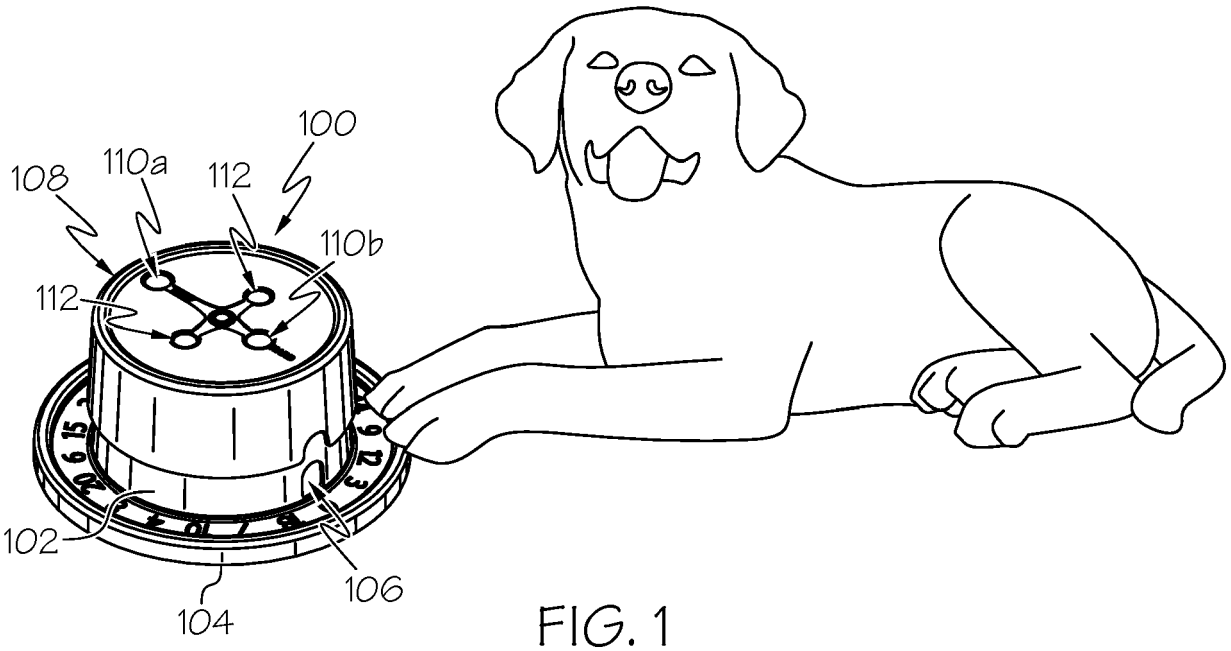

FIG. 1

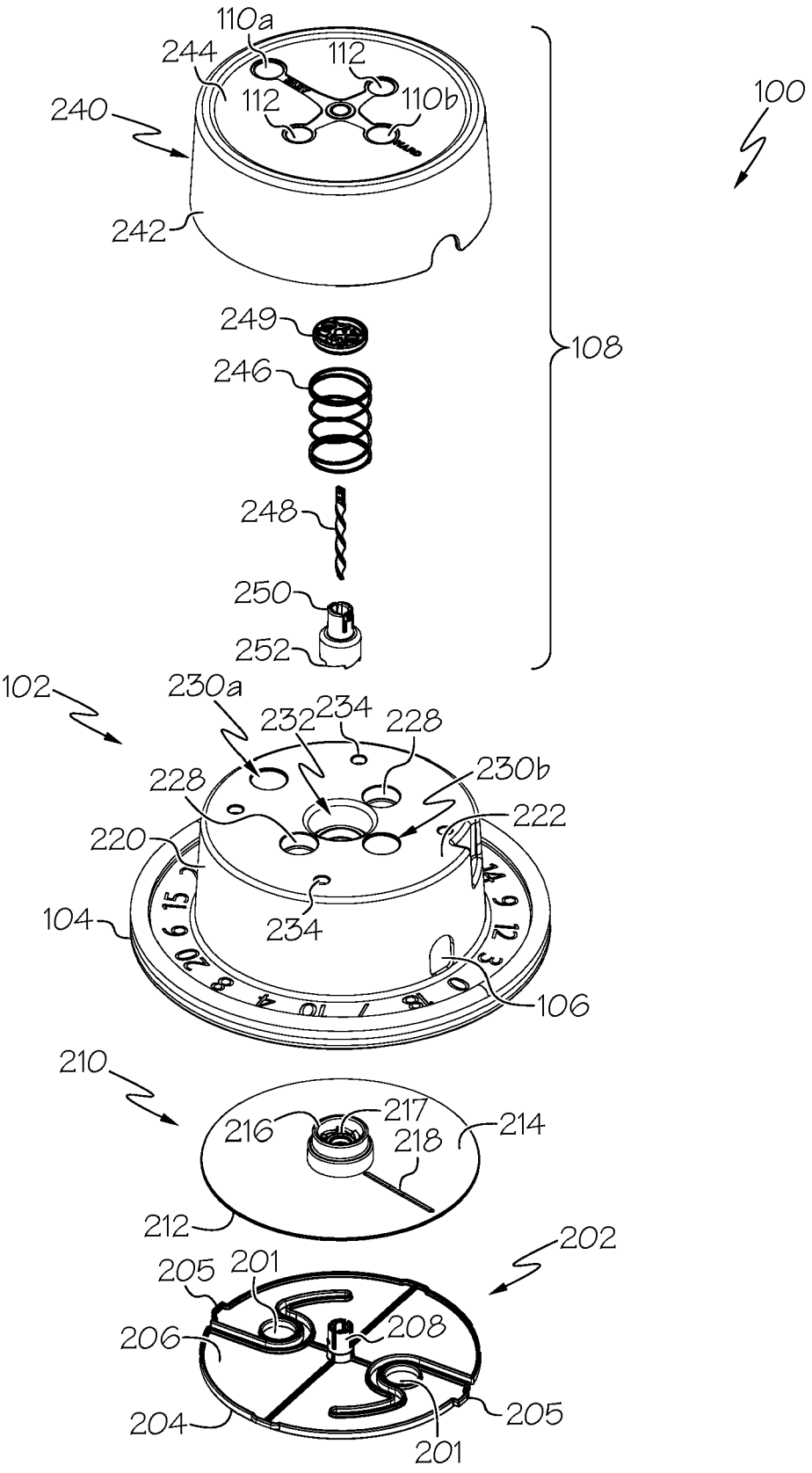
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FIG. 2

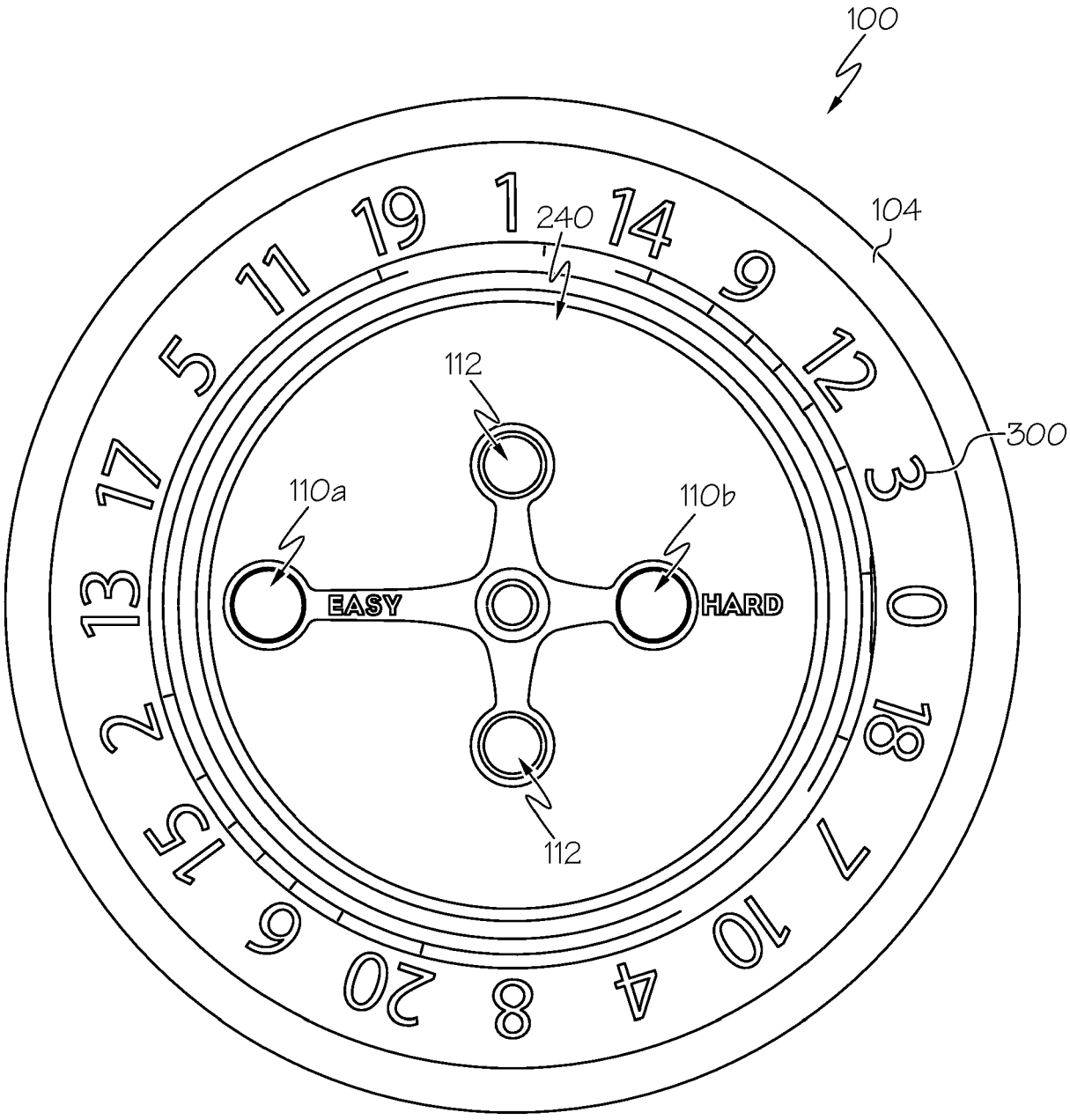
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FIG. 3

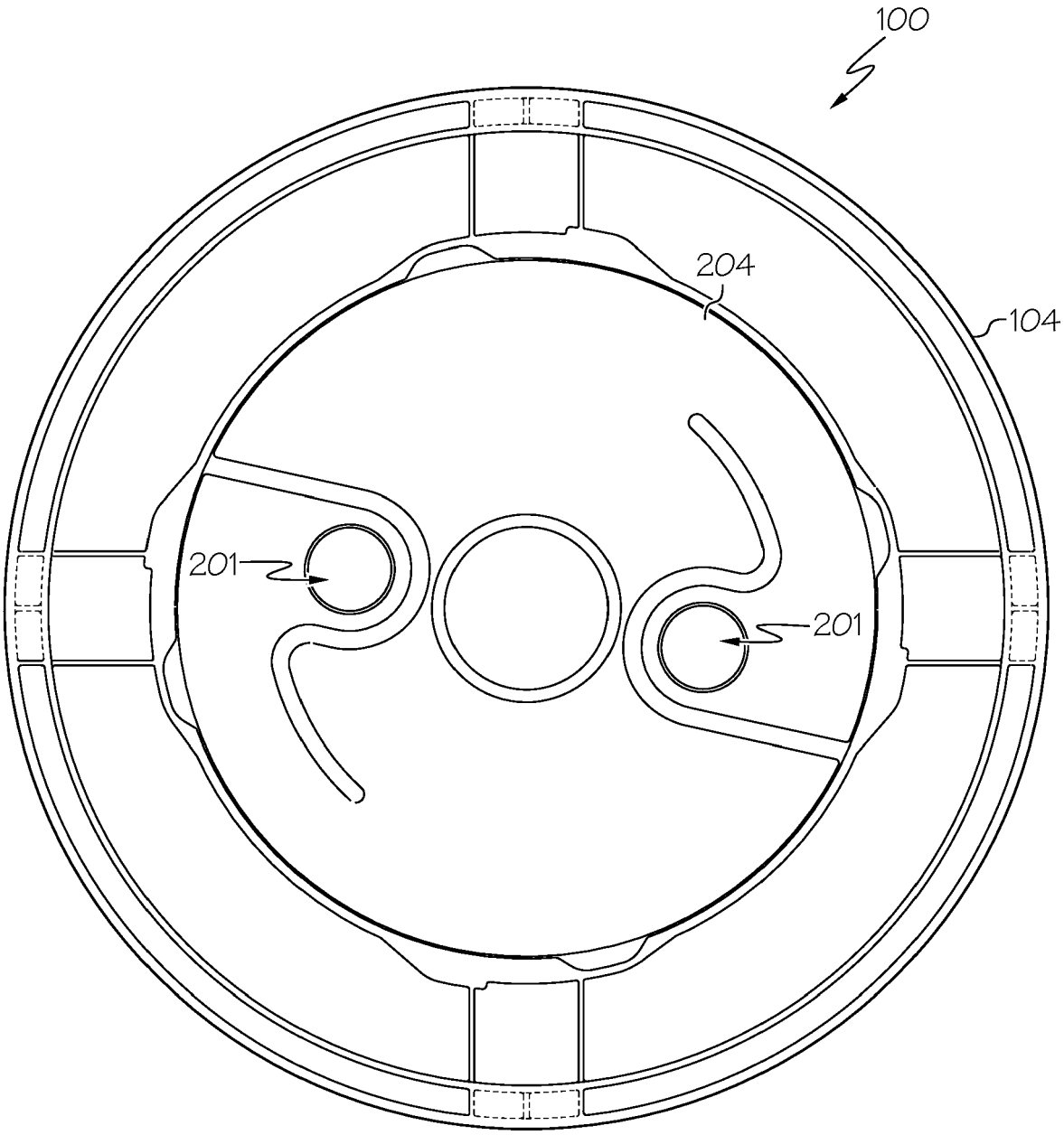

FIG. 4

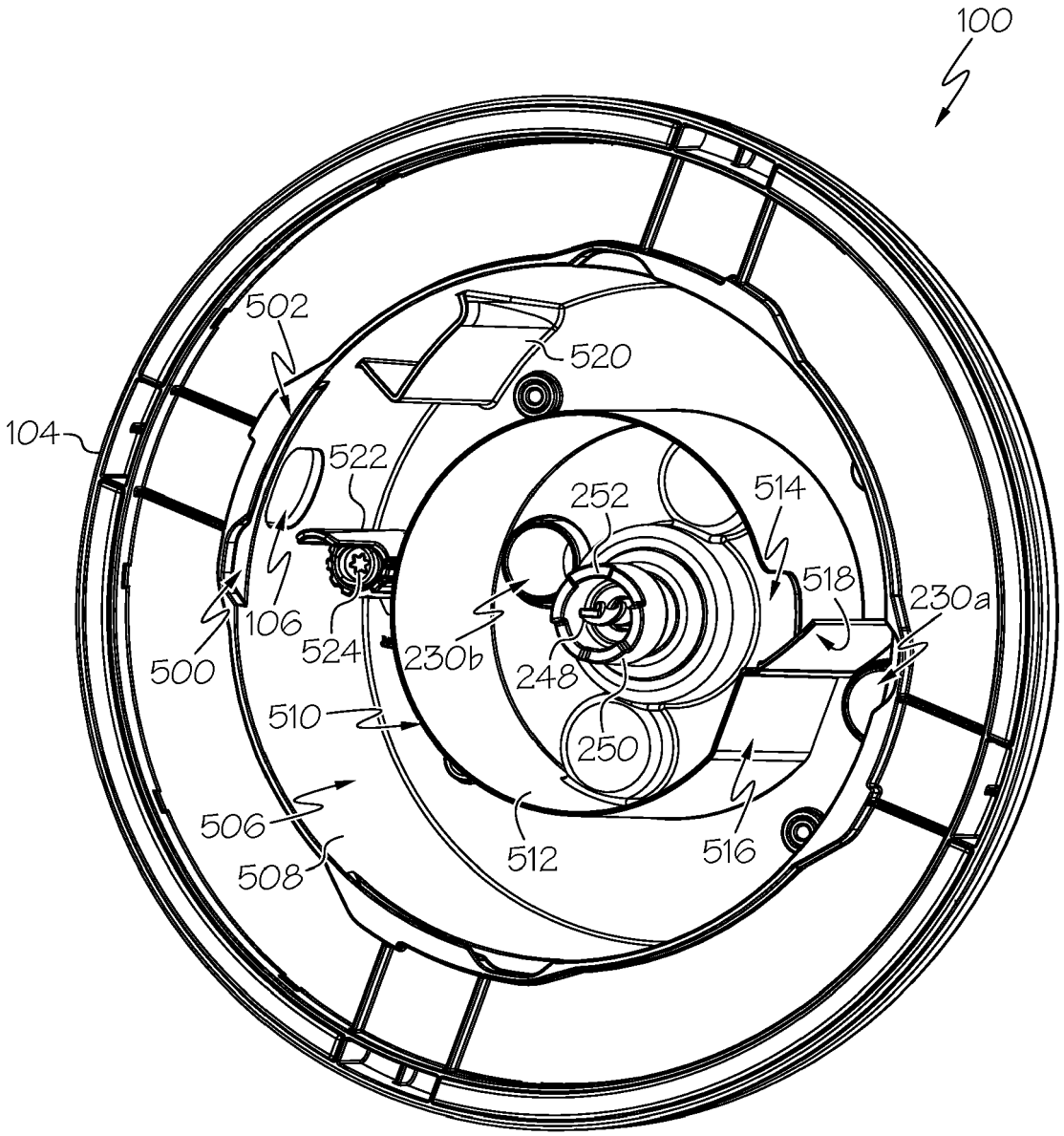
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FIG. 5

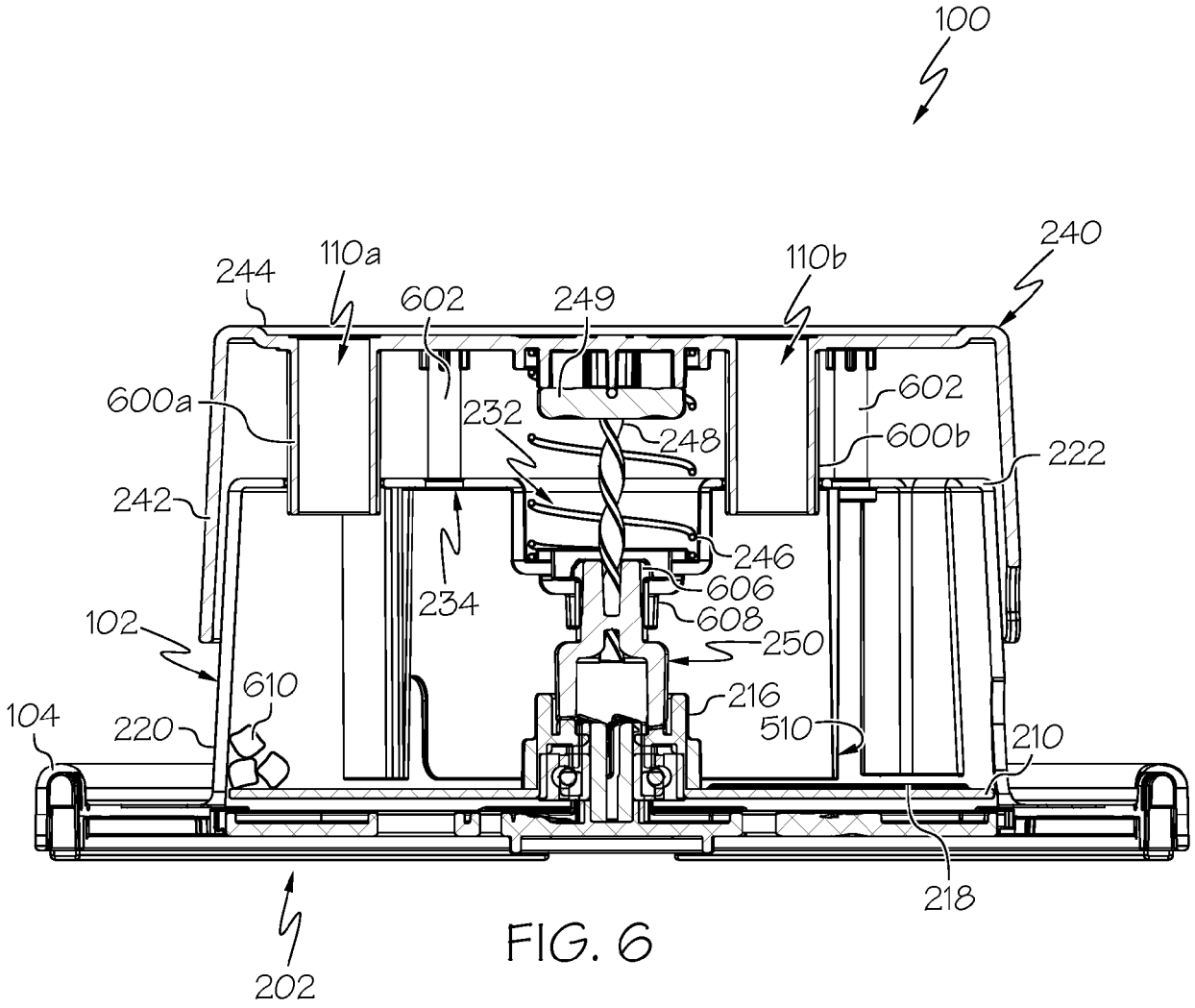
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FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 21 15 4688

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 June 2021	Steinbock, Lorenz

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15-06-2021

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